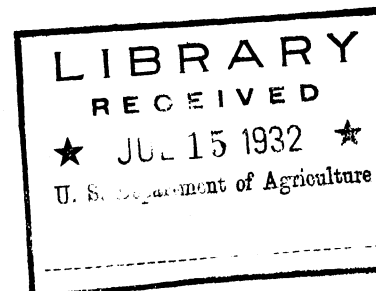


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COST OF USING WORK STOCK ON MID-WESTERN FARMS

By S. R. Speelman, Associate Animal Husbandman,
U. S. Bureau of Animal Industry.

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During the fall and winter of 1929 the Divisions of Animal Husbandry, Farm Management and Costs, and Agricultural Engineering of the Bureau of Animal Industry, Agricultural Economics, and Public Roads, respectively, United States Department of Agriculture in cooperation with the agricultural colleges of the States of Illinois, Indiana, Iowa, Michigan, and Missouri conducted a field survey to study the utilization, efficiency, cost, and dependability of various kinds of farm power. Selected sections in each of the five cooperating States were chosen on the basis of type of area and of farming and detailed records were taken from farm operators on all uses of power, rates of work, costs, and other items which entered into the production and marketing of farm commodities for the period of one year, 1929. The farms on which the records were taken represented "average" rather than "best" practices and the data obtained, therefore, may show variations from that obtained in State "cost route" surveys.

A total of 736 farm records having comparable data were obtained in the survey. Of these records, approximately one-half show that animal power was relied upon principally for field work and other farming operations of various kinds. These records are classed as "horse records" and are the ones on which this report is based.

From the total number of horse-farm records obtained, ten from each State have been selected which show the lowest operating cost per hour of horse work, consistent with good farming practices. Table 1 gives the data on the farm acreage, acres of crops, crop acreage worked per horse, number of crops grown, number of work stock used, hours of horse work per head, and the cost per hour of horse work on the farms in this selected sample. Farms in this sample varied in total acreage and number of work stock used as follows: Illinois - 180 to 360 acres, 4 to 12 horses; Indiana - 80 to 400 acres, 2 to 12 horses; Iowa - 160 to 320 acres, 4 to 10 horses; Michigan - 84 to 266 acres, 2 to 6 horses; Missouri - 160 to 320 acres, 3 to 14 horses.

Table 1.

Work-Stock Data for Selected Low-Cost Group of Farms

	<u>Illinois</u>	<u>Indiana</u>	<u>Iowa</u>	<u>Michigan</u>	<u>Missouri</u>
Number of farms	10	10	10	10	10
Average farm acreage	236.5	193.7	212.4	192.0	227.7
*Average crop acreage	182.5	163.5	150.6	124.3	163.5
Average number of crop acres worked per horse	24.0	27.7	25.5	24.8	25.9
Total number crops grown	45	33	41	60	50
Total number work stock	76	59	59	50	63
Average number hours horse work per head per year	956.8	936.6	972.5	1047.1	935.0
1/Average cost horse work per head per hour	8.3¢	7.6¢	8.1¢	8.3¢	9.4¢

* Includes only acreage on which horse work was done during the year covered by the survey.

Includes all costs except that of housing. Costs based on 1929 prices.

Perhaps the most significant item in Table 1 is the relatively high amount of work obtained per head annually from the work stock used. On a ten-hour-a-day basis this represents 93.5 days as the minimum, and is in striking contrast to the averages for horse work on all the horse farms in the five States, which were as follows: Illinois, 68.2 days; Indiana, 77.6 days; Iowa, 72.1 days; Michigan, 75.4 days; and Missouri, 63.7 days. Coupled with this extensive use of work stock, and undoubtedly in a large measure resulting from it, is a greatly lower cost per hour of horse work for the farms in the selected sample than that of the average horse farms. As shown in Table 1, the average State costs per hour of horse work varied between 7.6 cents and 9.4 cents among the picked farms. Average costs per hour of horse work for all horse farms, on the other hand, were as follows: Illinois, 12.9 cents; Indiana, 12.0 cents; Iowa, 12.7 cents; Michigan, 14.2 cents; and Missouri, 16.2 cents.

In determining the costs of keeping and using workstock, Table 2, a large number of factors entered into the computation. The unit charge applied to certain cost and credit items is the average value of these items as obtained either from farmers' estimates, from the various cooperating State agricultural colleges, or from the Division of Crop and Livestock Estimates, United States Department of Agriculture. For feed, the average farm values for the year of 1929, as obtained from the Division of Crop

and Livestock Estimates, were applied, which were as follows: corn 78 cents, oats 42 cents, and barley 60 cents per bushel; oil meal \$3.16 per hundred pounds; legume hay \$13.76, mixed and non-legume hays \$10.95, corn stover \$3.88, straw \$4.36, and succulent roughage \$4.63 per ton. Pasture at \$1.41 per month and bedding material at the rate of \$3.97 per ton and one ton per head were based on operator's estimates. Chore labor, as based on farmers' estimates, averaged 23.5 cents per hour. The charges for shoeing, veterinary service and medicine, and harness were also farmers' estimates. Interest was figured at 6 per cent on the average work-stock investment; while depreciation or appreciation for all classes of work stock included 3-year-old colts which were used during the year and represents the difference in value of work stock in the opening and closing inventories. In calculating colt credit, the estimated value of foals born during the year was subtracted from the totals paid out for breeding fees. Mature credit for all farms was obtained by applying figures obtained from the cooperating States for mature value per horse. The values used were as follows: Illinois, \$8.00; Indiana, \$10.00; Iowa, \$11.39; Michigan, \$15.00; and Missouri, \$10.00. It was not possible to obtain or apply an equitable cost figure for housing so this was omitted from the computation, although it logically constitutes a charge for work-stock maintenance.

Outstanding in the cost items for work-stock maintenance, Table 2, are the charges for feed and chore labor. Combined, these items averaged 84.4 per cent of the total gross cost on farms in the selected sample and 83.7 per cent for all horse farms. Other cost and credit items were quite variable, but it should be noted that in four of the five States the average of appreciation and other credits in the selected farms exceeded that of the averages for all farms. This was partly due to more colt credit, reflected in higher average breeding fees per farm in the selected sample, and to less depreciation. That low-feed and chore-labor costs, although generally very desirable and essential to low maintenance costs, do not necessarily result in the lowest cost of keeping work stock is illustrated by the records taken in the State of Michigan. Here the annual charges per farm for both feed and chore labor on all horse farms were lower than those in the ten selected farm but the gross and net costs per farm were greater.

Since 1929 there has been a decided change in the prices of feed and chore labor in the States covered by the survey. If the year of 1931 is taken for comparison, the department's figures indicate that chore labor has declined 28 per cent below 1929

levels and that corn was 40 per cent, oats 45 per cent, and hay, straw, succulent roughage, and pasturage about 20 per cent lower in value than in 1929. All these savings in the two items which constitute so large a portion of the total cost of work-stock maintenance result in a reduction of approximately one-third of the net cost per year per farm and the cost per hour of work of horses used on horse farms in Illinois, Indiana, Iowa, Michigan, and Missouri. Further projection of this comparison for 1932 shows a still greater reduction in costs of using work stock, which in some areas approximate one-half to two-thirds that found in those areas in 1929.

Table 2.
Cost of Keeping Work Stock Per Farm*

	Illinois	Indiana	Iowa	Michigan	Missouri
Farms in Survey - Selected farms	10	10	10	10	10
All farms	78	73	89	70	66
Total number of work stock-Selected farms	76	59	59	50	63
All farms	652	448	570	305	461
Average breeding fees-Selected farms per farm	\$12.00	\$5.50	\$10.50	\$6.50	\$3.65
All farms	5.13	5.51	4.51	3.20	3.05
Average feeding costs-Selected farms per farm	\$484.30	\$368.00	\$400.98	\$352.02	\$412.81
All farms	577.70	481.95	508.88	349.67	622.61
Average shoeing cost- Selected farms per farm	\$1.30	\$3.95	\$3.40	\$3.90	\$.10
All farms	1.49	5.02	1.87	4.79	.90
Average veterinary and medicine cost- Selected farms per farm	\$5.85	\$5.70	\$1.35	\$3.85	\$1.60
All farms	6.53	4.31	3.01	4.46	2.41
Average harness - Selected farms cost per farm	\$11.87	\$10.82	\$10.22	\$12.57	\$15.52
All farms	13.73	10.92	14.14	12.61	16.28
Average chore labor - Selected farms cost per farm	\$94.96	\$57.22	\$105.80	\$114.42	\$90.73
All farms	110.54	78.83	86.92	109.50	85.25
Average interest charge-Selected farms per farm	\$39.52	\$26.04	\$33.75	\$22.58	\$37.10
All farms	51.13	34.64	41.40	27.73	37.75
Average depreciation- Selected farms charge per farm	\$8.50	\$5.60	\$15.50	\$5.00	\$14.50
All farms	42.00	9.00	10.63	18.86	20.30
Average bedding cost - Selected farms per farm	\$30.17	\$23.42	\$23.42	\$19.85	\$25.01
All farms	33.19	24.36	25.43	17.30	27.73
Average gross cost - Selected farms per farm	\$688.42	\$506.26	\$604.93	\$540.70	\$601.01
All farms	841.44	654.70	696.73	584.12	816.28
Average appreciation, - Selected farms colt credit, manure	\$113.90	\$84.00	\$142.70	\$127.30	\$85.50
All farms	105.85	82.78	109.39	81.11	94.47
Average net cost - Selected farms per farm	\$574.52	\$422.26	\$462.23	\$413.40	\$515.51
All farms	735.59	571.92	587.34	467.01	721.81

* All prices on 1929 basis.

EAH

WHAT'S NEW IN THE STATES

Georgia

W. F. Ward, for the past two years a cooperative representative of the U. S. Bureau of Animal Industry and the Georgia State College of Agriculture in field animal husbandry work, has been made superintendent of the Chinsegut Hill Reserve at Brooksville, Fla., where he will have charge of the agricultural research work for the department.

J. G. Liddell and W. T. Bennett have been appointed field agents in animal husbandry in cooperation with the U. S. Bureau of Animal Industry, effective June 1.

J. R. Ricks, who is working on pasture and grazing problems in the South had headquarters transferred from Starkville, Miss., to Athens, Ga.

Illinois

During the past winter a total of 1,785 farmers signed registration cards at 55 county livestock feeding schools and indicated thereon the number of horses they would work in single teams in 1932. A total of 566 farmers or approximately 32 per cent of all of them in attendance indicated that they would use five or more horses in one team this season. This shows that practically one-third of the men who are progressive enough to attend these feeding schools appreciate the big-team idea and are using it. This was very pleasing for although I have been pushing the big-hitch program for nine years with hundreds of demonstrations in 73 counties, it is a far better showing than I expected would be made. --E. T. Robbins.

Indiana

The Wayne County Hog School on February 9 and 10 was attended by 306 different people. Newspaper publicity started three weeks prior to the school featuring the program and an attendance contest. Merchants and feed dealers offered awards and those attending the sessions on time took part in the drawing for awards at the close of each session. This plan gave a complete registration of all who attended and held the crowd to the close. Model pigs cut out of red cardboard carried a slip of white paper announcing the time, date and location of the school, and 24 posters were placed in prominent locations throughout the

county. Local swine breeders were in charge of each day's program and a committee of farmers took charge of the registration and other details. The hog production information was given by J. W. Schwab. Two local veterinarians took charge of the "posting" demonstrations and discussed the control of external and internal parasites. All plans for the school were arranged with the help of county swine committee of ten farmers.

Missouri

H. M. Garlock, formerly an animal husbandry specialist, has accepted a position as fieldman for the St. Joseph Stock Yards Company with headquarters at St. Joseph, Mo.

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HOG FEEDING IN MISSOURI

One hundred and twenty hog-feeding demonstrations were completed during the year and 7,044 farmers were reported as having adopted the practices recommended. Twenty-nine demonstration meetings were held with an attendance of 1,004, and 61 general hog meetings with an attendance of 3,078. Proper methods of feeding, management, and sanitation were discussed at each of these meetings.

Previous recommendations for fattening spring pigs, namely, the use of one-half gallon of tankage to one bushel of corn fed on good pasture, were modified, in some cases, because of feed prices and dry weather. Wheat was selling cheaper than corn during the greater part of the summer and in that period it was recommended that hog feeders substitute wheat for corn in the fattening ration. This substitution resulted in much wheat to hogs coupled with the same recommendation for feeding cattle was partly responsible for the 23 per cent increase in the amount of wheat fed in 1930 as compared to 1929. Fifty-seven of the 67 men cooperating on hog-feeding demonstrations in 1931 fed some wheat.

These home-grown grains, corn and wheat, when supplemented with tankage or tankage and linseed oil meal have proved both practical and economical as hog feeds.

---From Annual Report, 1931.

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The best way to encourage the production of livestock yielding meat cuts preferred by consumers is for retailers and packers to let the farmer know through prices what consumers prefer. --C. B. Denman.

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MISSOURI BEEF-PRODUCTION CONTENT, 1931

By H. M. Garlock,
Missouri Extension Service.

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The results obtained by farmers entered in the Fourth Annual Missouri Beef Production Contest again emphasize the possibilities of increased returns through the raising and feeding of calves, keeping the land in grass and the marketing of rough feeds through cow herds.

The 50 herds entered in the 1931 contest demonstrated that even with the beef prices which prevailed during the last half of the year it was possible for Missouri farmers to utilize profitably their rough feed and pasture through beef cows in the production of choice light-weight grain-fed calves. In every instance the calves, after paying for their mothers' keep, showed a satisfactory return. Although the returns were not so great as in previous years the records indicate that calves from properly managed herds produce a cash income sufficient to pay taxes and interest on the land utilized and give a satisfactory return for labor and the investment in cows.

In every instance the records indicated that calves of choice quality dropped during January, February, and early March were more desirable for grain feeding while suckling, found a better outlet, and were more profitable than later calves.

That the contest has had a desirable effect on the adoption of practices recommended in the Beef Herd Project is indicated by the number of farmers adopting such practices in each of the last four years. In 1928, 295 farmers were reported as adopting recommended practices as compared with 815 in 1929; 2,254 in 1930, and 3,106 in 1931.

The contest was sponsored by the Kansas City Chamber of Commerce, The Kansas City Stock Yards Company and the Hereford, Shorthorn and Aberdeen-Angus registry associations in cooperation with the Missouri College of Agriculture. A total of \$650 was offered in cash prizes with the stipulation that all prize money be spent toward the purchase price of registered bulls. Medals were offered in a class provided for previous winners. Three of the winners in the 1931 contest and one from 1930 bought bulls in the series of spring consignment bull sales.

Results of the 1931 Beef-Production Contest

Name	J. C. Whorton	R. E. Nicholson	Duendckel Bros.	Homer Semon	W. H. Semon, Jr.
Address	Hickory	Lucerne	Jefferson City	Rocheport	Rocheport
Breed	Hereford	Angus	Angus	Hereford	Shorthorn
No. calves	17	17	10	18	19
Date of initial wt.	May 23	June 1	June 1	April 24	May 5
Ave. initial wt. (lbs.)	415	270	305	259	261
Final wt. mkt. (lbs.)	761	649	703	594	572
Ave. gain head (lbs.)	346	379	398	335	311
Days fed	149	174	182	159	148
Ave. daily gain (lbs.)	2.32	2.18	2.19	2.11	2.10
Feed per calf:					
Corn (bu.)	19.25	17.5	27.25	17.25	14.75
Oats (bu.)		4.0		3.5	3.0
L. S. meal (lbs.)	161	50		22	45
C. S. meal (lbs.)			300		
Molasses (lbs.)	69	22		11	68
Hay (lbs.)	200		100	150	155
Feed cost per calf	\$13.60	9.91	16.36	9.67	9.85
Selling price	\$ 9.23	9.50	9.00	9.85	9.85
Value per head	\$70.22	61.65	63.27	58.48	56.31
Ave. dressing percent	60.1	58.9	59.6	61.0	61.0
Rating in contest	first	second	third	fourth	fifth
Amt. prize	\$200	\$150	\$100	\$100	\$100

Feed prices: Corn \$.45 bu.; oats .25 bu.; C.S. meal 1.20 cwt.;
L.S. meal 1.80 cwt.; molasses 1.50 cwt.; hay \$10.00 ton.

Mr. Whorton's feed record showed that his cow herd had been maintained during the year on pasture, hay, and fodder at a feed cost of \$19.50 per head.

King Brothers, winners of the contest in 1930, topped the "previous winners" division. They fed 25 calves sired by a Hereford bull and out of registered and grade Hereford cows. These calves consumed 22.5 bu. corn and wheat, 6 bu. oats and 3.25 bu. of soybeans and 260 pounds of soybean and timothy hay per head. Six were sold November 4 on the Kansas City market for \$10.60 a hundred. Ten were sold the following week for \$11.00 and 8 sold on November 12 for \$10.75 and one for \$9.00. The 25 head made an average daily gain of 2.11 pounds during the 200-day feeding period, weighed 695 pounds each at the market and grossed \$84.65 per head. They dressed 59.8 and the carcasses were rated by government graders as being ideal for present day beef trade. The carcasses were well marbled and evenly covered with a thick, creamy white fat.

FAH

MEASURING PROCESS

All animal husbandry workers appreciate the need for better methods of measuring the practical value of livestock extension work, also that such measures have greater value if originated and applied by agencies outside the field of extension. We are rapidly learning that it is not sufficient to know that recommended practices are being adopted in increasing numbers, and that the influence of the adoption of such practices on the industry is of far greater importance. As time goes on it is expected that such tests will become more and more the means by which the real value of extension work is determined, and on which its future largely will depend.

In the following discussion, Rex Beresford of Iowa has taken advantage of an opportunity to apply a practical yard stick to Iowa's swine production. The result shows significant progress in efficiency during the past eight years.

We are interested in obtaining information on the use of similar devices for measuring progress in other states and in connection with the production of other classes of livestock. Who has something to contribute? -- C. D. Lowe

Iowa Swine Growers Make Improvement

Department of Agriculture records indicate that Iowa swine producers have made notable progress toward more efficient pork production during the past eight years. These reports show that the average litter saved to weaning age in 1923 was 4-1/2 pigs. In 1931 this figure had been increased to 6 pigs per sow, a gain of 33-1/3 per cent during the 8-year period. That this gain is really significant and not merely a matter of luck and weather is suggested by the fact that, each year, some increase has been made over the previous one and in no case has the average increase been more than one-third pig per sow over the preceding year.

On the basis of a single litter this increased efficiency per sow does not seem large, but with Iowa now producing annually about twelve and a quarter million hogs, it means that

our farmers are producing their pig crop with approximately one-half million fewer sows than would have been required under the reduced efficiency indicated by the 4-1/2 pigs average litter of 1923. -- Rex Beresford

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ONE EXTENSION NEED

If there is one outstanding need in extension work it is that the problems, situations, and practices of the great mass of people be discovered, analysed, correctly diagnosed, and solutions found which the majority may and can safely adopt, learn, and use with success. We need to develop more of the outside-in point of view instead of continually and sometimes solely carrying out what college and station think people may need.

With this should come, too, the concept that the recommendations made must be based upon more than the biologic factors of production or certain home-making skills. This implies a broadening of our objective to include larger phases of the problem of creating more satisfying rural life conditions. Income for the farm as a whole, as affected by farm organization, management, adjustment to economic situations and trends needs to be better understood by the specialist and by dint of working with other specialists in related fields, projects may be developed which will help farmers to adjust the operations of the farm as a business, instead of by piecemeal refinement of various specialties.

But these things will not come as fast as we may wish if each specialist pegs away at his or her own specialty with a constant tendency to refine it until the great hoi polloi are left outside because of their inability to follow.

It is exceedingly desirable to analyze animal husbandry problems, for example, and to have our proposed solutions criticized in the light of cold economics. Specialists in economics, therefore, can help a lot in developing long-time production programs and in relating them to other fields. So-called biologic specialists also can help the economists to see to a greater degree livestock production and marketing problems from the standpoint of the man who is directly confronted by them.

--H. W. Hochbaum.

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PASTURED AND LIVESTOCK FOR ROUGH LAND

By A. T. Semple, Associate Animal Husbandman,
U. S. Bureau of Animal Industry.

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Most every State in the humid parts of the United States has considerable areas of land, which are too rough for cultivation and would not justify the expense of adequate terracing. Continuous or intermittent cropping and continuous erosion are bringing much of such land nearer and nearer the point of uselessness for agricultural purposes. And yet many of the occupants of such land apparently will and in many cases must continue to live on such land and endeavor to get a part or all of their living from it. What is the best solution to such a problem? Apparently there is none which can be applied without considerable effort, cost or sacrifice. To let things go as they are would mean the abandonment of the land. Such results have apparently come to pass in other parts of the world.

While the maintenance and reestablishment of forests and woodlots has a very important place in the economy of our individual farms as well as that of the States and nation, such policies and practices are not adequate for farmers whose chief resources are gullied fields, that would naturally grow up in persimmons and sassafras. A large proportion of such farms already have enough wooded land to supply the needs of the farm perpetually, if it is properly cared for.

And so there seems to be only one answer left that will work. More pastures and better livestock. Even that is a slow up-hill job. It requires seed, phosphatic fertilizer, and labor, but much less of each than for cultivated crops. If only small seedlings are established at first much of the seed may be home-grown. While a good cover of grass not too closely grazed will stop most of the erosion, gullies and bald spots will require much attention and labor until the whole surface is well sodded. It has been determined in northern Missouri and southern Iowa on land that is quite rolling that as much erosion takes place on corn land in one year as on bluegrass pasture in 47 years.

Then there is the problem of keeping down and eradicating weeds and brush. Clipping, grubbing, burning and properly controlled grazing should accomplish that. While very close grazing throughout the season is bad for a pasture, it is good to graze

very closely for a short time before the end of the growing season in order to make use of the less palatable forage and to give a new chance to plants that are near being crowded out. Using several kinds of livestock on pasture increases its productive value, because some stock eat plants that others will not eat.

A larger area of land in pasture does not involve the production of a bigger supply of livestock and livestock products if the increased grazing area results from a decrease in the amount of land in cultivated crops, because cultivated crops such as corn, produce generally more feed per acre than pasture, but at considerably more cost.

The problem of better livestock in both purebred and grade herds should be solved largely by more careful management, more adequate feeding and more exacting selection of the breeding stock raised on the farm. Individual performance records based on observations, weights and measures for the parents should determine which of the young stock should be kept to perpetuate the herd or flock. The extent to which purebreds are used in grade herds must depend in the end upon improving our purebreds at least as fast as our grade livestock is improved.

Thus far our chief arguments for more pastures are those of stopping erosion and reducing the outlay for seed, fertilizer and labor. Others could be advanced, such as the greatly reduced rate of soil depletion on account of products which may be marketed from the farm. If 40 bushels of corn are sold from the farm, it takes away permanently definite quantities of nitrogen, phosphorus, potassium and other elements. When an acre of forage from pasture is consumed by livestock, at least 75 per cent of the elements contained therein are returned to the soil in a readily available form and at no expense in labor or cash. Therefore, expenditures necessary for soil fertility maintenance, leaving out erosion, are only one-fourth as great for pasture as for cultivated crops marketed or fed where their fertilizing value is lost.

Studies of land utilization in Laurel County, Kentucky, made by C. F. Clayton, U. S. Bureau of Agricultural Economics and W. D. Nicholls, Kentucky Agricultural Experiment Station and reported in Technical Bulletin No. 289 of the U. S. Department of Agriculture, show clearly the importance of pastures and livestock in rugged areas such as the Cumberland Plateau of eastern Kentucky.

The soils of Laurel County, a typical section of this

region, are chiefly residual, being derived from sandstones and shales with narrow alluvial deposits along the larger streams. About 60 per cent of the land is in farms averaging 60 acres each. About one-third of the farm area is in crop land, one-fourth in pasture, and one-fourth in woodland not pastured. Most of the pasture is crop land temporarily abandoned. While all of it was originally cleared for cultivation, 10 to 25 per cent is now conceded by the occupants to be unfit for future cropping.

On 52 typical farms studied for 3 years, 1926 to 1928, 30 per cent of the land is smooth to rolling (slope under 10 per cent), 15 per cent needs drainage, 12.5 per cent is rolling to rough (10 to 20 per cent slope), 41.5 per cent is rough to steep, and 10 per cent is rock and outcrop or stony land. Of the total area of these farms 45 per cent has been overcropped and is badly eroded. The principal crops are hay, 45 per cent of the crop area, corn 31 per cent, oats 14 per cent, wheat 5 per cent, and soybeans 2 per cent. Corn yielded only 20 bushels per acre, oats 10 bushels, and hay 1,131 pounds. For over one-third of the cultivated land the cropping sequence is corn one year followed by small grain seeded with grass; for nearly half, corn two years followed by grass. Most of the balance is put in corn two or three years followed by a pasture crop or fallow.

There is a general cycle of clearing woodland and then farming it until productivity almost vanishes, with intermittent periods of rest or pasturing for four to six years during which sprouts and other vegetation grow up, check erosion, and furnish some grazing. Then the land reverts to woodland again.

For the period studied the net return from all pasture was \$0.78 per acre and \$1.58 per acre from the same land in harvested crops. The smooth-to-rolling land in fair to good physical condition comprising nearly one-fourth of the total area in farms is excluded from this comparison because practically none of it is used for pasture. The average net returns from this land were \$5.75 per acre. However, on a certain class of rough land with slope of 20 per cent or more, but which had been so cared for that there was only slight erosion, the net returns from pasture were \$3.39 per acre with costs of \$2.46. The same land in harvested crops netted \$4.64 per acre, with costs of \$11.84.

As similar land, heavily eroded, yielded only 34 cents per acre in pasture, the authors conclude that satisfactory pastures can not be established or maintained on such overcropped land for short periods. They state in addition "Since much of the land of this area is rolling or steep, the proper utilization of the land

in any system of cropping must provide a sod cover for the land most of the time. It follows that grass-eating and roughage-eating livestock are necessary to an efficient farm economy. Laurel County is in a deficit feed area and prices of both grain and roughage feeds are high. Livestock, to be profitable, must be limited as a rule to the kinds and numbers that can be carried on home-grown grass and roughage supplemented by limited quantities of purchased concentrates."

Much valuable information on pasture improvement and management is contained in Bulletin 538 "Soil and Field-Crop Management for Cayuga County, N. Y.," published by the Cornell University Agricultural Experiment Station.

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OKLAHOMA CLUB WORK

When the final club count was made on July 1, 1931, there were 3,102 pig club members enrolled representing all of the 77 counties of the State; 1,074 baby beef club members enrolled in 64 counties; and 332 lamb club members enrolled in 54 counties of the State. This represented an increase in enrollment over that of 1930 of 300 pig-club members, 89 calf-club members, and 2 lamb-club members.

Number of 4-H Club Animals Exhibited at Oklahoma Fairs and Shows in 1931.

	<u>Pigs</u>	<u>Beef calves</u>	<u>Lambs</u>
Community fairs	592	175	98
County fairs	1278	454	419
3 State fairs and the Oklahoma			
4-H Livestock Show	205	225	146
Total	2075	854	663

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LIVESTOCK COUNCIL OF 100 ORGANIZED

A permanent council of one hundred, appointed by the Federal Farm Board at the request of the advisory committee, held its first meeting in Chicago, March 25. Col. George A. Seaman, Taylorville, Ill., was elected president; Col. Edward N. Wentworth of Armour and Company, vice president, and F. G. Ketner of the National Order Buying Company, secretary. About 12 special committees were nominated which will meet and report at the next meeting of the council some time during the fall. The committees to be appointed will deal with such subjects as transportation, research, retail methods, packer problems, producer cooperation and a number of other projects which will be reported later.

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BEEF-CATTLE WORK IN NORTH CAROLINA

By L. I. Case,
Cooperative Agent in Animal Husbandry.

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In the fall of 1930 my work took me into the Coastal Plains area of North Carolina where there was little interest in beef cattle and where no beef cattle extension work had ever been done. Before making any very definite recommendations or making any attempt to promote the industry it was thought best to get at the facts. With this in mind several farm projects were outlined that could serve either as experiments or demonstrations, or both.

Pastures

Working on the assumption that permanent pasture is the foundation of a beef-cattle industry in this section several pasture projects were planned. One of these was the effect of various fertilizers on pastures already established. On several farms one to two and one-half acre tracts of established pasture were fertilized in the spring of 1931 as follows:

500 lbs 4-8-4 fertilizer per A.	Check	111 lbs Nitrate of Soda per A.	250 lbs of 16% Superphosphate per A.
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This in general was the simple test conducted, although several variations were made, such as to include another plat on which potash, or a combination of potash and phosphate, or manure was used.

Observations the first year showed an increased growth and spread of lespedeza on the complete fertilizer and phosphate plats. The reverse seems to be true on the nitrate plats although this may be due to stimulation of the growth of the grasses and consequent competition.

Carrying Capacity of Carpet Grass and Lespedeza

On a farm in Jones County, which is bordering the tidewater section of the State, a 14.2 acre pasture of very good carpet

grass and lespedeza, with a fairly good set of White Dutch clover and some Dallis grass was found to be carrying 26 head of steers ranging in weight from 400 to 600 pounds. This pasture is six years old and has been heavily grazed each year. Between June 8 and September 8 the cattle gained a total of 2,960 pounds with no supplementary feed. Such gains, averaging over 211 pounds per acre for three months, indicate that carpet grass and lespedeza furnish palatable and nutritious grazing and that their carrying capacity is about equal to that of other pasture plants. Plans are now under way to divide this pasture, fertilize one-half of it and measure the carrying capacity of each half during the coming season.

On W. W. Jarvis' farm in Currituck County 67 head of cattle varying in age and weight, grazed all or part of the time on 30.25 acres of lespedeza, carpet grass, and Dallis grass pastures, and six acres of native pasture, gained a total of 10,687 pounds with no supplementary feed. The length of the season during which those gains were made was May 1 to October 28. The per acre gain was 294.81 pounds.

For the purpose of comparing the value of improved pasture with what is generally considered good native pasture, six dry cows were grazed from May 13 to September 16 on the native pasture and from September 16 to October 28 on improved pasture. The comparison of gains was as follows:

The six cows on native pasture for 127 days gained 550 pounds, while the same six cows on improved pasture for 42 days gained 510 pounds. On a cow-day basis this was a gain of 0.72 pounds per day on native pasture and of 2.02 pounds per day on improved pasture.

Value of Crop Gleanings

In order to learn something of the carrying capacity of corn and soybean stalks for wintering cattle, records were kept during the winter of 1930-1931 on a cooperating farm in Currituck County. These records showed that on 89 acres of corn stalks, from which over 40 bushels of corn per acre had been harvested, 65 acres of soybean stalks that had yielded 15 bushels of beans per acre, and 16 acres of rye, 43 head of cattle of mixed ages made a total gain of 2,855 pounds from November 19 to March 10. The cattle had the run of the fields with no shelter. The nearer mature the animal the better it wintered under these conditions. Spring calves weighing 310 to 385 pounds made gains averaging 44 pounds, while calves and yearlings weighing 500 to 600 pounds made gains of 78 pounds per head. One two-year old steer gained

120 pounds during the 110-day period. Dry cows of not excessive ages made very good gains while cows nursing calves lost weight.

It is realized that one year's work is not sufficient on which to base conclusions, but it at least indicates that corn stalks, soybean stalks, and winter cover crops can be used profitably for wintering beef cattle.

Fattening Cattle for Market

In this section there is increased interest in the feeding of cattle for market. Farmers are being attracted to this work either for the utilization of home-grown feeds, or the production of manure for increasing soil fertility. Several of these feeders have been used as demonstrators and meetings have been held at their farms.

Better Breeding

The majority of cattle in eastern North Carolina are "natives" of indiscriminate breeding. In order to improve these cattle about 100 head of purebreds of the Hereford, Shorthorn, Aberdeen-Angus and Red Polled breeds have been shipped in during the past 18 months. The majority were bulls and their influence is already evidenced in an improved quality of calf.

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NORTH DAKOTA PUREBRED SIRES

	<u>Beef Cattle</u>	<u>Hogs</u>	<u>Sheep</u>
Farmers assisted in buying or exchanging purebred sires	311	507	811
Sires purchased or exchanged	318	637	2,098
Farmers assisted in selling or exchanging purebred sires	138	168	385
Sires sold or exchanged	169	496	1,097

-----EAH-----

A total of 678 purebred boars were placed with farmers of Alabama directly through the efforts of county agents. Demonstrations were completed by 3,162 farmers in swine sanitation, feeding balanced rations, and in proper management to produce pork more economically. These demonstrations involved 45,873 hogs.

--From 1931 Annual Report

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LAMB IMPROVEMENT IN OREGON

By H. A. Lindgren, Extension Animal Husbandman,
Oregon Extension Service.

County Agent J. C. Leedy of Douglas County, has been working on a very interesting project which fits into the general extension program in the State and deals with the improvement of lambs on the farm. Douglas County contains a considerable acreage of hill land and a sheep population of nearly 150,000 head, made up mostly of small flocks. This is an early lamb section with an abundance of grass during the early spring months. Most of the lambs are sold in California markets and in the Northwest.

The extension program in the State has been stressing management methods that would result in a higher percentage of "top" lambs marketed before the grass dries up in the summer. It is desirable that the lambs be sold by the first of July. The growers are being encouraged to produce such early lambs and to manage and feed the ewes and the lambs so that the lambs will not be checked in growth or condition of flesh before selling time.

In order to emphasize these practices more fully Mr. Leedy enlisted the cooperation of business men and others to contribute prize money for some contests among the producers of his county. For example, a very substantial premium was offered to the grower who could show the highest percentage of lambs per ewe at weaning time. Another was offered for the group of growers who could show the highest percentage of "top" lambs marketed before July 1. Other contests dealt with wool which terminated in a wool show held following shearing time.

These contests have been most valuable in that county in furnishing material for publicity in which the extension program was emphasized. They will be continued through this coming season. In addition, a lamb show is being staged this summer. Premiums will be offered on the best pen of strictly market lambs, both singles and in lots of five. It is planned to carry on a grading demonstration in connection with the judging of these lambs at the show.

Money for premiums for the lamb show has been contributed by outside firms, while the Chamber of Commerce at Roseburg, the county seat, is donating pens and space for holding the show.

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RECENT PUBLICATIONS

"Modern Methods in Beef Production" by Peters and Morris -
Minnesota Extension Service Special Bulletin No. 146.

"Fitting and Showing Beef Calves" by D. E. Richards -
Montana Extension Service Circular No. 20.

"Wintering Beef Cattle at Low Cost" by Vinke and Richards -
Montana Extension Service Circular No. 24.

"Corn, Wheat and Rye for Fattening Calves" by M. L. Baker -
Nebraska Experiment Station Bulletin No. 263.

"Market Classes and Grades of Yearling Beef" by W. C.
Davis - U. S. Department of Agricultural Circular No. 208.

"The Relation of Nutrition to Contagious Cattle Abortion"
by Hart, Hadley and Humphrey - Wisconsin Experiment Station
Research Bulletin No. 112.

"Quality Lamb Production" by Delmer H. LaVoi - Michigan
Extension Service Circular.

"Lamb Feeding Experiments with Grains and Dried Beet
Pulps" by James A. Holden - Nebraska Experiment Station Bulletin
No. 268.

"The Use of Cottonseed Meal, Cottonseed Hulls, and
Molasses in Fattening Rations for New Mexico Range Lambs" by
P. E. Neale - New Mexico Experiment Station Bulletin No. 200.

"Feeding Lambs in Montana" by Richards and Vinke -
Montana Extension Service Circular No. 26.

"Wintering Sheep at Low Cost" by Vinke, Richards and
Pearson - Montana Extension Service Circular No. 28.

"Wool Marketing" by Alva H. Benton - North Dakota Experi-
ment Station Bulletin No. 252.

"Controlling Stomach Worms in Sheep and Lambs" by E. M.
Nighbert - U. S. Department of Agriculture Leaflet No. 89.

"Economic Phases of the Mohair Industry in Texas" by T. R.
Hamilton - Texas Experiment Station Bulletin No. 444.

"Comparative Values of Hog Feeds" by C. M. Vestal -
Purdue (Indiana) Extension Service Leaflet No. 156.

"Rations for Swine" - Purdue (Indiana) Extension Service Leaflet No. 157.

"Killing and Curing Pork" by Regenbrecht and Snyder - Texas Extension Service Circular No. 60.

"Suckling Pig Losses and Anemia" by L. P. Doyle - Purdue (Indiana) Experiment Station Circular No. 188.

"Hog Outlook - Prospects for 1932"- Washington Extension Service Economic Leaflet No. 3.

"Corn and Hog Surplus of the Corn Belt" - a book by Alonzo E. Taylor of Stamford University, California.

"Utilizing the Soybean Crop in Livestock Feeding" by Rusk and others - Illinois Experiment Station Circular No. 369.

"Feeding Soybeans and Soybean Oilmeal on Indiana Farms" - Purdue (Indiana) Extension Service Bulletin No. 180.

"Meat Investigations in Missouri" by Trowbridge and others - Missouri Experiment Station Bulletin No. 300.

"Can We Improve Our Range?" by M. S. Morris - Colorado Extension Service Bulletin No. 313-A.

"Sudan Grass for Summer Pasture" by L. R. Neel - Tennessee Experiment Station Circular No. 44.

"Extension Program in Agriculture and Home Economics, 1932" - Illinois Experiment Station Circular No. 383.

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